



TRACY (E.O.)

A New Material for Surgical Splints and Jackets, with a Method for Applying it.

Read in the Section on Surgery and Anatomy, at the Forty-fourth
Annual Meeting of the American Medical Association.

BY EDWARD A. TRACY, M.D.
BOSTON, MASS.

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A NEW MATERIAL FOR SURGICAL SPLINTS AND JACKETS, WITH A METHOD FOR APPLYING IT.

This material, in its crude form, is old as the hills—for the members of the energetic wasp family have used it, time out o'mind, in the construction of their homesteads. I refer to wood pulp.

There are many varieties of pulp board on the market, and to give their characteristics in detail would needlessly take up your time; suffice it to say they were tried and found wanting. The needful combination of properties sought for was plasticity, toughness, elasticity and rigidity. It took some experimentation to get the desired product, but my task was lightened by consulting my friend, Mr. Charles H. Fish, of Manchester, N. H., a gentleman familiar with every branch of pulp manufacture.

The experiments made, and the manufacturing processes employed, might form matter for interesting discourse in the laboratory and the mill; I do not propose to claim your attention for them here, but shall place directly before you a sample of the finished material, and explain how the practical surgeon bends it to his will and produces therefrom a good surgical splint.

A sheet of the material is taken and the splint-blank of the shape intended cut from it. Ordinary arm and leg splints can be outlined immediately on

the pulp-sheet and cut without other pattern. For more complex splints, as of the elbow, shoulder, spine, or pelvis, it is serviceable to first cut a pattern of cloth or paper laid over the part in the position it is intended to retain it, and afterwards, with this pattern for a guide, the proper shaped blank can be cut from the sheet of pulp board. The splint-blank

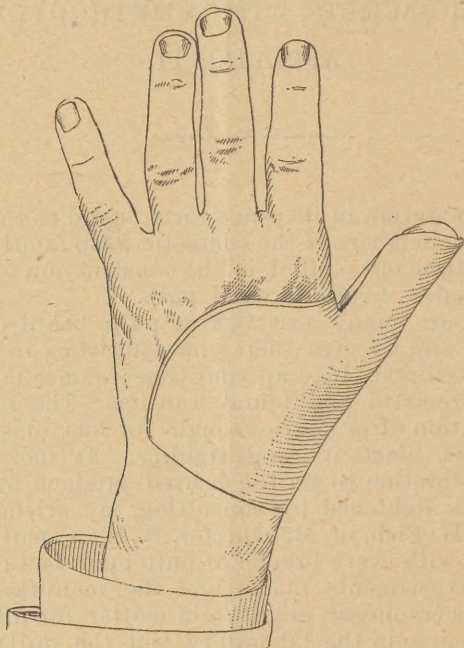


FIG. 1.

should be moistened (best done by means of a brush) with water, or a stiffening solution, just enough to render the material plastic; then it should be carefully molded over the part with the aid of a roller bandage; after being so retained for a moment, let it be removed and dried. An accurately fitting splint results.

Of the various stiffening solutions tried, that of potassium silicate gives particularly good results. The solution ordinarily sold for surgeons' use and further diluted with water (10 to 50 per cent. according to the rigidity desired) can be conveniently used. This solution hastens the drying process, adds rigidity to the splint, prevents perspiration from softening it,

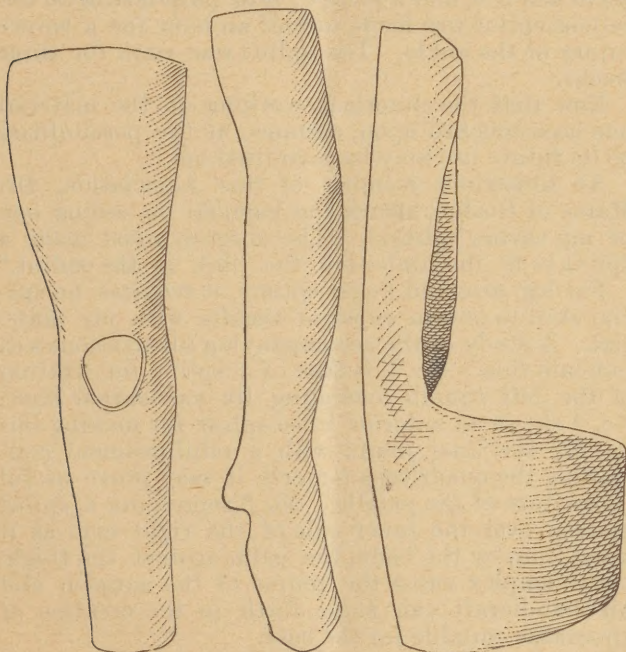


FIG. 2.

FIG. 3.

FIG. 4.

and renders the splint antiseptic. These facts are illustrated in the specimen shown, a splint made in fifteen minutes for a case of compound fracture of the right forefinger; during a part of the time it was worn, its distal end was plunged thrice daily into an antiseptic solution and you can witness how it withstood the treatment. (See Fig. 4.)

A solution of dextrin serves well, adding toughness and stiffness to the material. It is convenient for the general practitioner because dextrin (to be had of paint wholesalers) can be kept in powder form and a solution extemporized at any time. Good results are gotten with water as a moistener, and I recall an emergency case treated last winter where with it, a kitchen fire, and a piece of this pulp board, an excellent splint was made in half an hour for a severe injury of the ankle. The splint was worn for three weeks.

Now that the practical working of the material has been touched upon, a glance at the possibilities of its future use may be permitted me.

An illustrious member of this Association, Dr. Marcy of Boston, struck the keynote on seeing one of my earlier splints: "The surgeon must make a splint to fit the limb—not the limb to the splint."

For leg, arm and finger splints, it requires no special skill to obtain superior results with my material. A study of the accompanying illustrations will indicate this. No. 1 is that of a splint for fixation of the left thumb, including its metacarpal bone. No. 2 shows an anterior knee splint for making immobile the knee joint; with a reinforcement controlling the quadriceps femoris it may prove useful in fracture of the patella. No. 3 represents a splint molded over the inner side of the right arm as it hung limp by the body, the palm against the thigh.

In complex cases the genius of the surgeon and his handicraft can shine forth in the creation of apparatus suitable for the case.

Apparatus heretofore impossible or rare because of its cost or the necessity for employing skilled tradesmen, will become plentiful.

Finally, knowing the properties possessed by this material, it requires but little foresight to comprehend the evolution in the near future of radically new apparatus for the treatment of various surgical affections.

In concluding, I feel happy to here express my hearty acknowledgment and thanks for suggestions and kindnesses tendered me by Drs. H. P. Bowditch, M. F. Gavin, G. W. Gay, H. M. Marcy and D. W. Cheever of Boston; also, to Dr. W. M. Conant, who very courteously placed suitable hospital cases at my disposal, when experimenting on the material.

